FLIGHT
The AIRCRAFT ENGINEER & AIRSHIPS

First Aero Weekly in the World.

Founder and Editor: STANLEY SPOONER

A Journal devoted to the Interests, Practice, and Progress of Aerial Locomotion and Transport

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CONTENTS

DIARY OF FORTHCOMING EVENTS

Club Secretaries and others desirous of announcing the dates of important fixtures are invited to send particulars for inclusion in the following list :—

Mar. 20 .... **"The Report of the Aeronautical Research Committee's Panel on Scale Effect," by Capt. W. S. Farren, before R.Ae.S.**
Mar. 24 .... **Annual Meeting of Inst.Ae.E.**
Mar. 24 .... **British entries close for Schneider Cup and Gordon Bennett Balloon Races.**
Mar. 26 .... **Visit to Works of S. Smith and Sons (M.A.), Ltd., Cricklewood. Inst. Ae. E.**
May 31–June 9 **Third Czecho-Slovak International Aeronautical Exhibition, Prague**
April 1 .... **Entries close for Schneider Cup and Gordon Bennett Balloon Races.**
April 3 .... **"The British Aviation Mission to the Imperial Japanese Navy," by Colonel the Master of Sempill, before R.Ae.S.**
April 11 .... **"Radial Engines for Aircraft," by Mr. S. M. Viale, before Inst. Ae. E.**
April 23 .... **Visit to National Physical Laboratory, Teddington. Inst. Ae. E.**
April 25 .... **Aero Golfing Society Team Match, Oxhey Golf Club.**
June 15 .... **Gordon Bennett Balloon Race, Belgium.**
June 21 .... **F.A.I. Conference Opens, Paris.**
Aug. 10 .... **Tour de France for Light 'Planes.**

EDITORIAL COMMENT.

THE Air Estimates themselves were dealt with in last week's issue of FLIGHT, when a *résumé* of the various main items was published. Since then (on March 11) the House has gone into Committee of Supply on these, and an abstract of the debate is published elsewhere in the present issue. The debate itself brought to light little that was new, but the introductory remarks of the Under-Secretary of State for Air, Mr. Leach, contained several interesting statements, and one or two surprises. The information vouchsafed by Mr. Leach relating to the manner in which very considerable reductions had been made possible as a result of the taking over by the R.A.F. from the Army of Iraq and of similar reductions in Palestine, at Aden, and elsewhere confirmed information already published and gives very striking proof of one sphere which, although once upon a time considered outside its scope, the R.A.F. is fulfilling in the most creditable manner. Incidentally, it is extremely gratifying to have a statement from such an admitted pacifist as Mr. Leach to the effect that those who had been in the habit of criticising the use of the R.A.F. for work of this nature could rest assured that the Air Force in Iraq was not engaged in shedding blood, nor was it offensively using the air weapon for purposes of terrorising. Similar statements from other sources have, it is to be feared, failed to convince those who did not wish to be convinced that this use of the R.A.F. was fully justified, and that the work was being carried out in a manner of which no Englishman need be ashamed. Perhaps these doubters will be satisfied now that they have been told the same thing by the present Under-Secretary for Air.

Air Estimates in the House

The reference to the units for co-operation with the Navy is interesting, and seems to show that as regards the supply of first-line machines the Navy has had little cause for complaint. Mr. Leach stated that the total "flights" (each flight consisting of six machines) were 21. This figure referred to first-line machines only, and not to spares and reserve machines. Thus, in spite of the continued obstinate—not to say

obstructive—attitude of the Admiralty, Mr. Leach's department seems to be fully justified in believing, as he stated, that this country is well ahead in all branches of naval aviation, or at least is not behind other nations as regards quality, whatever may be the position numerically. The Under-Secretary also stated that the scheme for co-operation drawn up by the Imperial Defence Committee had been accepted by both services, and he hoped it would be in operation in the near future. Here the Under-Secretary seems to have been somewhat too optimistic, as it is now stated that the scheme has been "voted" unworkable, and that a number of anomalies were claimed to exist. It seems, therefore, that the whole question is *again* to be referred to the Committee of Imperial Defence with a view to finding a solution. Regrettable as this fact is, it need cause little surprise. Nobody who knows the Admiralty could expect that any opportunity would be lost of making another attempt at getting its own air service, and apparently the change of Government was considered to form such an opportunity, although from recent utterances this would seem to be as hopeless as all the other attempts. It is to be regretted that the Admiralty insists on thus deferring the amicable co-operation between the two services. The Air Ministry has done all in its power to reach an understanding, but the obstinate, hide-bound tradition spirit in Whitehall has been too much for them. We have not the slightest doubt that when the subject is again referred to the Imperial Defence Committee, the result will be the same, and probably by then there will be another change of Government, and the Navy will have another try. The only ultimate solution seems to be a Ministry of Defence, as has been repeatedly urged in various directions.

Mr. Leach's reference to light aeroplane clubs is interesting, and seems to indicate that when suitable types of two-seater light 'planes have been evolved as a result of the competitions to be held in September under the competition rules and auspices of the Royal Aero Club, the Government may be prepared to give assistance in some form or other to the formation of such clubs. Mr. Leach stated that at present he was not asking for any money, but that possibly in a year's time, with some luck, the scheme might be ripe for presentation.

A certain amount of criticism was levelled at the Air Estimates for not including definite provision for airship development, but frankly, we are not greatly perturbed on that score, as it must sooner or later be arranged, and it should be remembered that, after all is said and done, those whose fault it is that Great Britain does not count at all in the matter of airships today are those who were responsible for abandoning our airship services two or three years ago.

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The Flight Around the World

On March 17 the four American Douglas "World Cruisers" left California on the first stage of their attempted flight around the world. This was a fortnight or so earlier than had originally been announced, and as a result the British attempt will commence also somewhat earlier than intended. If all goes well it is expected that the Vickers "Vulture," amphibian with Napier "Lion" engine, will leave Southampton Water on Tuesday of next week, March 25, on the first stage of its flight. The crew of the "Vulture" will be Squadron-Leader A. S. MacLaren, pilot, Flying-Officer W. N. Plenderleith, navigator, and Flight-Sergeant Andrews, engineer. Whereas the American attempt will be made from east to west, etc, the British machine will fly from west to east, and will follow to a considerable extent the same route, but in the opposite direction.

There is a distinct difference in suitability of the two routes, or rather courses, and it is generally thought that making the flight from west to east, as our people are doing, is more favourable. Certainly the long stretch across the Atlantic is more easily covered in that direction, as the prevailing winds are westerly or south-westerly. There is a further considerable difference in the equipment of the two attempts. The Americans have pinned their faith to land machines which can be fitted with floats for certain stages of the journey, while the Vickers is an amphibian flying-boat, equally capable of starting from and alighting on land and water. The Americans have four machines flying together, so that in case one gets into trouble the others may either alight and render assistance or may divide and go after help, according to circumstances. The British machine and its crew must mainly rely on their own resources. On the other hand, it is possible to argue that with four machines there are just four times as many chances of something going wrong, and so the fact that, on the face of it, the British machine is handicapped as regards numbers need not necessarily be the drawback it seems to be. We are sure all our readers will join us in wishing the gallant crew, British and American, safe journeys and success to the most meritorious "team."

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At St. James's Palace

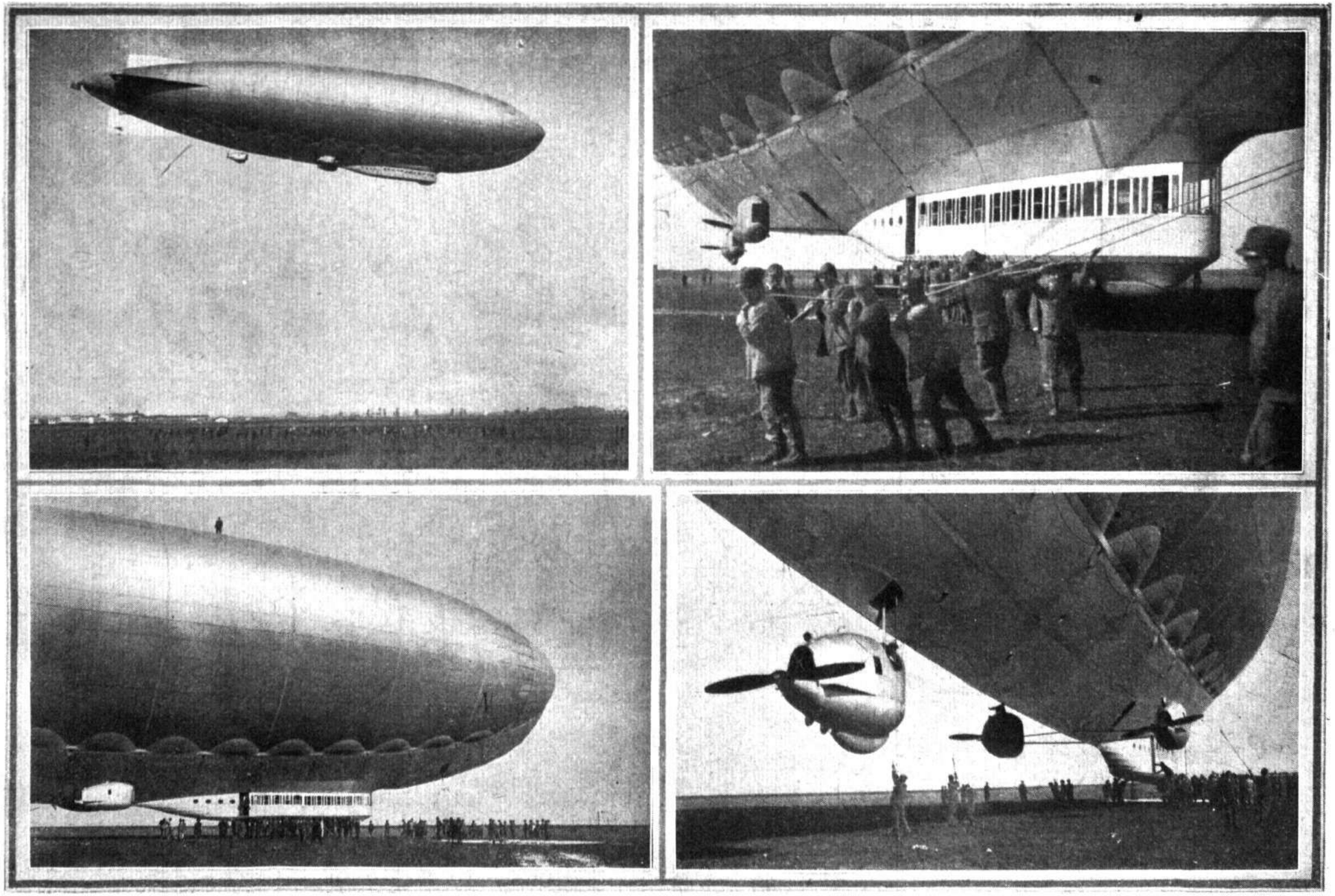
AMONGST those present at the Levèe held by His Majesty the King at St. James's Palace, on March 11, were :—Air Chief, Marshal Sir Hugh Trenchard, Principal Air Aide-de-Camp, Lieutenant-Aviateur Chevalier Willy Coppens, Captain Silvio Scaron, Commander J. C. Hunsaker, the Rt. Hon. Lord Thomson, Secretary of State for Air, Air Vice-Marshal Philip W. Game, Air Commodore C. A. Longcroft, Sqdn.-Ldr. P. Bebington, Sqdn.-Ldr. G. R. Reid, etc.

The following were amongst those presented to the King.—Flight-Lieut. A. Brooke, Sqdn.-Ldr. W. Bryant, Flight-Lieut. T. Clogstoun, Sqdn.-Ldr. A. Cole, M.C., D.F.C., Flying Offr. G. Dean, Sqdn.-Ldr. H. Gordon-Dean, A.F.C., Sqdn.-Ldr. F. Don, Sqdn.-Ldr. J. Everidge, M.C., Flight-Lieut. O. Gayford, D.F.C., Sqdn.-Ldr. H. Hanmer, D.F.C., Staff Chaplain the Rev. S. Jones, M.C., Flight-Lieut C. Pilkington, A.F.C., Flight-Lieut. E. Simpson, Flight-Lieut. F. Vincent, Pilot Offr. G. Worthington, etc.

U.S. Army World-Flight Starts

At 9.32 a.m., on March 17, Major F. L. Martin and Lieuts. Lowell H Smith, and Leigh Wade, of the U.S. Army Air Service, left Clover Field, Santa Monica, Cal., on the first stage of the flight round the world. The fourth member of the expedition, Lieut. E. H. Nelson, who flew to San Francisco the day before for compass calibration, will join the flight at Washington. As previously announced in FLIGHT, the machines used for this flight are four Douglas "World Cruisers," each fitted with a 420 h.p. Liberty engine. Each pilot is accompanied by a mechanic, but at the time of writing their names are not known. The day before the start was the occasion for an "aerial circus" at Clover Field, where a large number of machines of various types gave aerial displays. On the day of the start big crowds were present to witness the departure of Major Martin and his companions.

Particulars of the machine were published in FLIGHT, December 13, 1923.



Photos. Press Bureau Aéronautique Italienne

THE ITALIAN "N" TYPE SEMI-RIGID AIRSHIP : Four views of the ship taken during its trials. On the left, top, the airship in flight, and below on *terra firma*. On the right, close-up views of the main cabin (top) and engine gondolas (bottom).

THE ITALIAN "N" TYPE SEMI-RIGID AIRSHIP

EXCEPT, perhaps, for the development of the rigid airship in Germany, progress in airship design has made a greater advance in Italy than in any other country. During the past 10 or 12 years Italy has produced various original types of airships —mainly of the semi-rigid class—which gave highly successful results, results which were improved upon year by year.

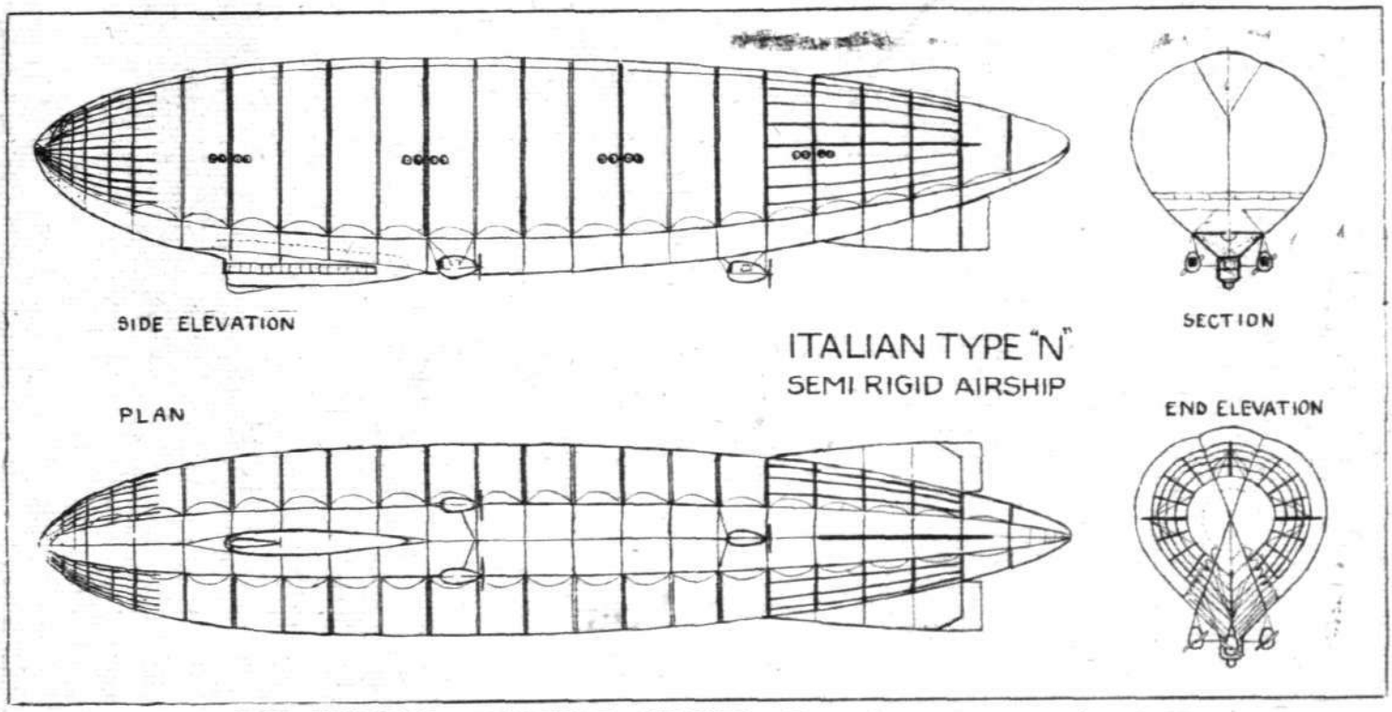
Many of these airships have been described or illustrated in past issues of FLIGHT, the most important types being the "P.," "P.V.," and "T.34." and their principal features should, therefore, be known to most of our readers. It may be as well, however, if we briefly outline the salient feature common to each of these types which not only renders the Italian airships distinct from all others, but which is, perhaps, the secret of their success. The feature referred to consists of an articulated metal keel extending from stem to stern along the bottom of the hull or envelope. The latter, which is made of rubberised three-ply cotton, is divided transversely into a number of compartments by means of fabric diaphragms, and along the bottom of the envelope is the compensating air compartment similarly divided. The whole lifting force of the envelope is concentrated in the keel by means of internal steel catenary suspensions. This form of construction varies in detail in the different types; for instance, in the "T.34" (the "Roma," *see* FLIGHT, January 26, 1922) the keel is more or less rigid, being of triangular or prismatic form—somewhat similar to the "catwalk" of the Zeppelin type.

Just recently Italy has produced, or is producing, at the Government Airship Construction Establishment, four new types of airships known as the "SCA," "OS," "PM" and "N" type, all of which embody the principle referred to above, but with several improvements. The first three types, which differ only in dimensions and details, are developments of the "P" type, whilst the "N" belongs to the "T34" class. Of the four types the "N" is perhaps the most interesting, and we therefore give below a brief general description of this ship.

For airships up to 6,000 cub. m., and even up to 15,000 cub. m., the "flexible" stiffening as employed on the "P" types has been found to give excellent results. For larger ships, over 15,000 cub. m., the keel, as previously stated, takes a more rigid form, and this applies to the "T34" and "N" types. The "N" type, although smaller in volume—having a capacity of 19,000 cub. m., as against 35,000 cub. m.—than the "T 34," is a great improvement on the latter ship. The following features go to make this improvement: (*a*) The employment of a better streamline form for the hull, combining greatest possible lift for certain limits of overall dimensions (it being desirable to house this type of ship in existing hangars at Rome, Milan and Taranto). (*b*) The rear portion of the keel is extended to form a rigid attachment for the tail surfaces. (*c*) The control and passenger car, formed integral with the keel, is located well forward, giving excellent visibility. (*d*) Engine nacelles detached from the hull and suspended from the keel by simple steel cables.

The shape of the hull selected for the "N" type compares very favourably with previous types, and is, as may be seen from the accompanying diagram, showing the comparison of hull shapes of the "M" (1915), "T 34" (1919), and the "N" types, of a much "finer" form. The system of internal steel cable catenary suspensions for distributing the lifting forces from the envelope directly to the knuckle joints of the keel does not differ materially from that obtaining in other Italian airships. This system of suspension, it should be pointed out, not only reduces the stresses on the fabric of the envelope, but also reduces the maximum vertical diameter of the hull.

In the "N" airship, the inside catenary suspensions are two in number. The effect of these, as may be seen on reference to the sectional view in the accompanying drawings of the ship, is to produce longitudinal furrows in the top of the envelope, in a similar manner to that obtaining in the Astra-Torres type airships. It may be of interest here to refer to some wind tunnel tests carried out by Eng. Nobile, of the Italian Airship Establishment, the objects of which were to ascertain whether or not these furrows had the effect of increasing the resistance of the hull. Two models, one of the "T 34" hull with furrows and the other of symmetrical form without furrows, were tested at velocities of 10, 20 and 30 metres per second and with the hull at different angles vertically to the wind direction. The results of these tests were as follows:—



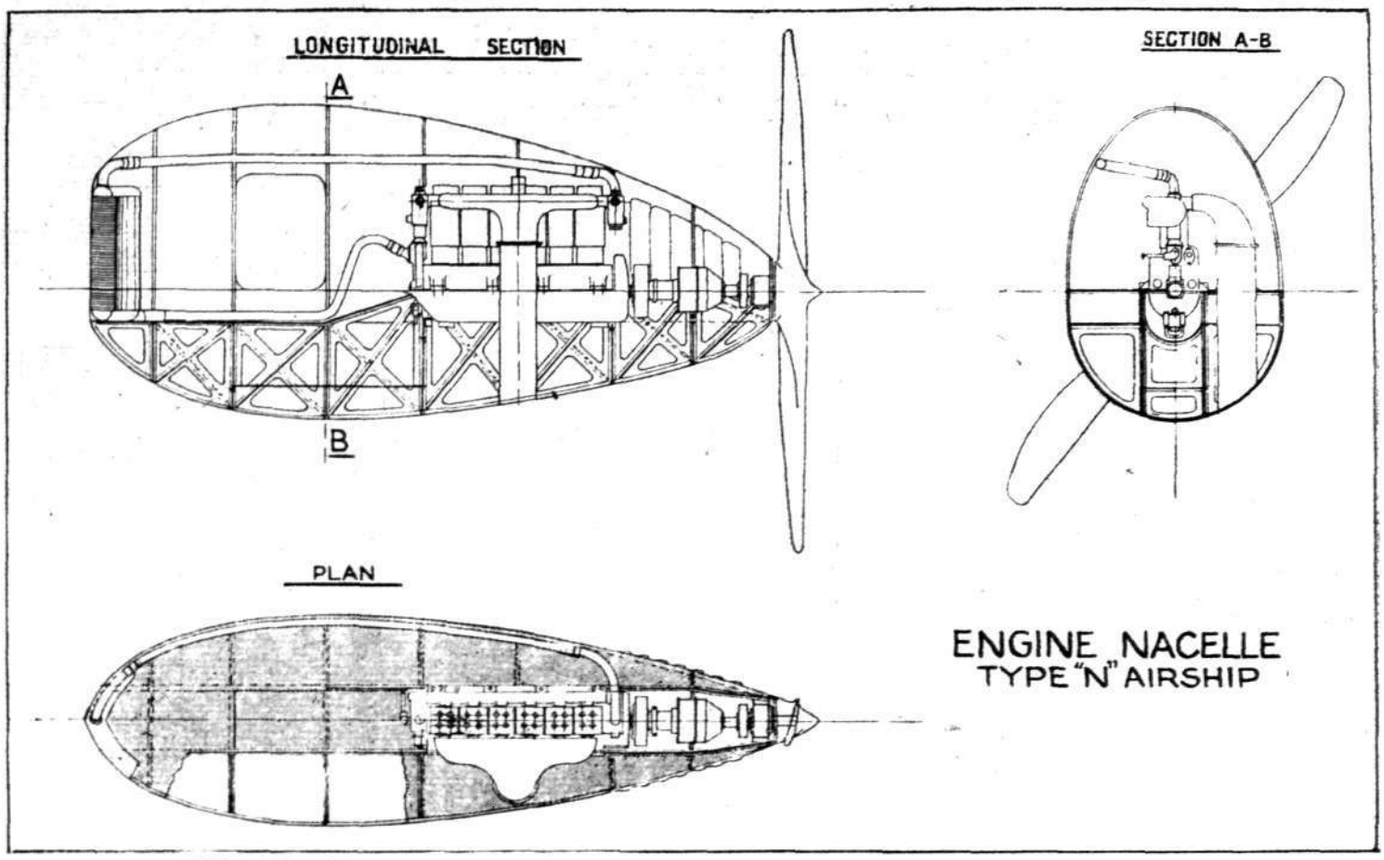
THE ITALIAN "N" TYPE AIRSHIP: General arrangement drawings.

Wind Velocity in Metres per Second.

	10		20		30	
	With furrows.	Without furrows.	With furrows.	Without furrows.	With furrows.	Without furrows.
−15°	23	25	89	88	201	196
−10°	17	18	65	66	145	143
− 5°	14	14	52	52	115	114
0°	13	13	47	48	105	106
+ 5°	14	15	51	53	113	116
+10°	18	20	69	70	154	153
+15°	25	28	99	102	227	225

From the above it will be seen that the effect of the furrows in many cases is to diminish the resistance to advance, but to an extent, especially at small angles, in which their influence may be considered negligible.

Tests were also carried out to ascertain the comparative resistance of the irregular pear-shape section of the Italian



THE ITALIAN "N" TYPE AIRSHIP: Drawings of one of the engine nacelles.

airship hull and the orthodox circular shape—both models being of the same profile and volume. The results indicated that the pear-shape had a greater resistance, but only to an extent of 2 or 3 per cent.

In the "N" type the keel consists of a prismatic framing of triangular section—at the control cabin, which is integral with the keel, the latter has a trapezoid section—to which the catenary sections are connected. The three longitudinal members of the keel and the members of the triangular section are

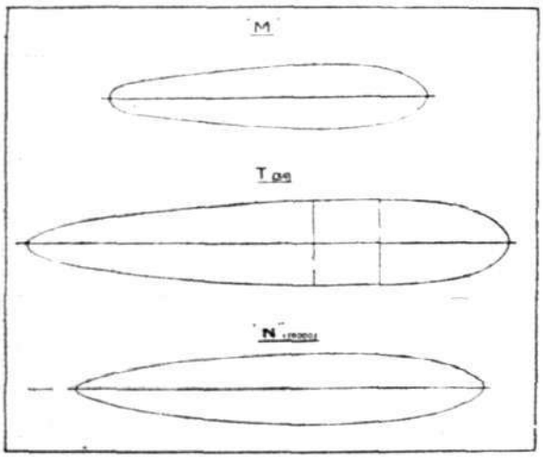


Diagram showing comparative hull shapes of "M," "T 34" and "N" type airships.

of steel tubing. Each beam consists of three steel tubes arranged in the shape of a triangle joined by steel braces, the beams being articulated at the knuckles. The articulation at the joints and the employment of non-rigid diagonals of steel cables impart great elasticity to the framing, and it is thus able to absorb accidental shocks, due to rough landing, etc. The strength of the framing is such that it is capable of withstanding any abnormal stresses that might be created in the event of a gas compartment being accidentally deflated.

The keel stiffening fore and aft extends in such a way that both the nose and the tail may be considered rigid and rigidly connected to the keel. The tail stiffening consists of a series of rigid members running along the parallels and meridians of the hull, the former members being joined to the keel. To four of the meridian members, those lying on the horizontal and vertical planes, are attached the fixed stabilising surfaces carrying the elevators and rudder. Steel cables connect up one surface to the other and the corresponding knuckles of the keel in such a manner that the entire structure forms a rigid cruciform empennage. The nose of the hull is similarly stiffened, and in the case of the "N" type is practically non-deformable even if the internal pressure fails.

As previously stated, the main control and passenger cabin forms an integral part of the keel, and is located forward. It is in direct communication with the interior of the keel. The fore part of the cabin is reserved for the pilots, and is provided with all the equipment and instruments necessary for navigation, wireless installation, etc. The passengers are located in the rear portion of the cabin, which is comfortably fitted up, accommodating 20 passengers. Large windows are provided along the sides of the cabin.

The "N" airship is fitted with three 250 h.p. engines, each of which is located in a streamlined nacelle built up of duralumin and communicating with the interior of the keel. These nacelles are suspended, by steel cables, from the keel, two being side by side immediately behind the main cabin, and the third some distance behind immediately below the centre of the keel. Each engine drives a propeller through a friction clutch, and is provided with a reverse gear.

Each gas compartment, of which there are five, is provided with special valves operated automatically or by the pilot. Air-bag pressure is maintained by an automatic intake valve located in the centre of the nose; this valve can be controlled by the pilot.

The principal characteristics of the "N" type airship are:—

Capacity	19,000 cub. m. (670,700 cub. ft.)
Length	106 m. (347 ft. 8 ins.)
Maximum height	26 m. (85 ft. 3 ins.)
Maximum diameter	19·5 m. (64 ft.)
Useful load	10,850 kg. (10·5 tons).
Total power	750 h.p.
Maximum speed	100 km.p.h. (62 m.p.h.)

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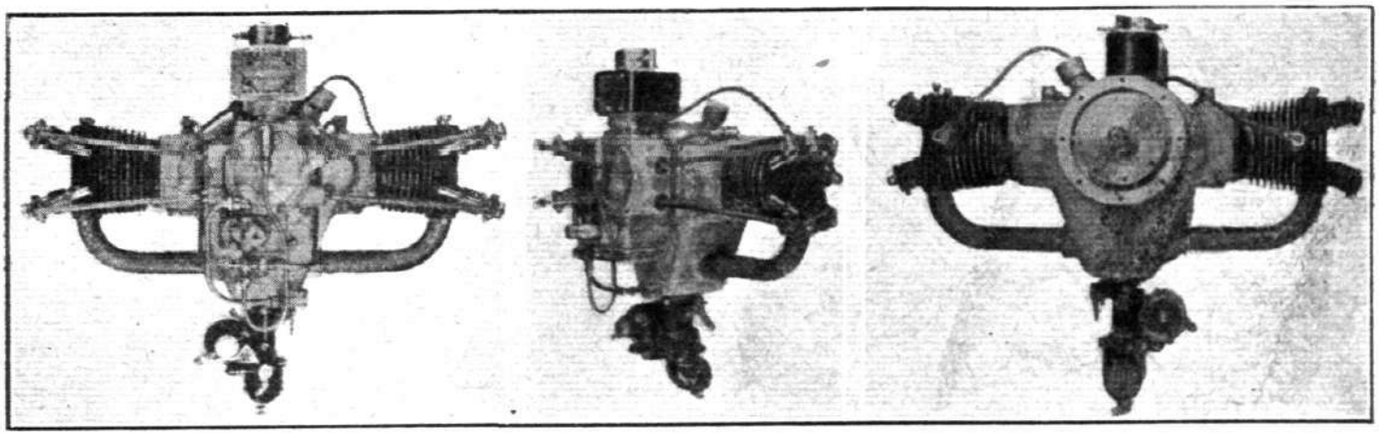
Australian Air Mail Extension

THE air mail service from Geraldton, Western Australia, to Derby has now been extended to Perth. The first air mail from the north-west reached Perth on January 15 last. Mails taken aboard at Broome were delivered in Perth, a distance of 1,360 miles, in 36 hours.

AN AMERICAN LIGHT 'PLANE ENGINE

The Morehouse "S.P.E." Horizontally Opposed Twin

A SMALL low-powered engine, suitable for use on light 'planes, has recently been produced by the Steel Products Engineering Co., of Springfield, Ohio, to the designs of Harold E. Morehouse. This engine is an air-cooled four-cycle type with two horizontally-opposed cylinders. As may be seen from the accompanying performance chart—readings for which were obtained from tests on a 75 h.p. electric dynamometer—this engine develops 15 h.p. at 2,400 r.p.m., at which speed the brake mean effective pressure is 116 lbs. Speeds round about 3,000 r.p.m., giving a b.h.p. of about 20, can be obtained and the engine operated with safety at this figure. The bore and stroke being 3 by 3 ins, the total piston displacement is 42·4 cubic ins. (695 c.c.). As the dry weight of this engine, including carburettor and magneto, is about 50 lbs., the weight per h.p. comes out at about 2·5 lbs.



Three views of the Morehouse "S.P.E." 12-20 h.p. Light 'Plane Engine.

The principal characteristics of the S.P.E. engine are:—

Bore	3 ins.
Stroke	3 ins.
Piston displacement	42·4 cubic ins. (695 c.c.)
B.h.p.	15
R.p.m.	2,400
Dry weight	50 lbs.
Weight/h.p.	2·5 lbs.
O.A. length	12⅜ ins.
Width	24¾ ins.
Height	19 ins.

The crankcase is an aluminium casting, having only one large opening at the back through which the crankshaft assembly is slipped into place. This opening is covered by the housing carrying the camshaft. The cylinders are carried by extensions of the crankcase, reaching about half-way up the cylinder barrel, which form chambers into which oil is fed from the oil pump. The oil sump is cast integral with the crankcase, and is so arranged that with a slight alteration it will function properly with the crankshaft axis either in a horizontal or vertical position. A small hole in the upper side of the cylinder barrel leads oil to the pistons, and oil spray from the latter lubricates the ball and roller bearings. Surplus oil fed into the compartments previously mentioned, serves to cool the lower part of the cylinder, and is returned to the sump through a separate passage.

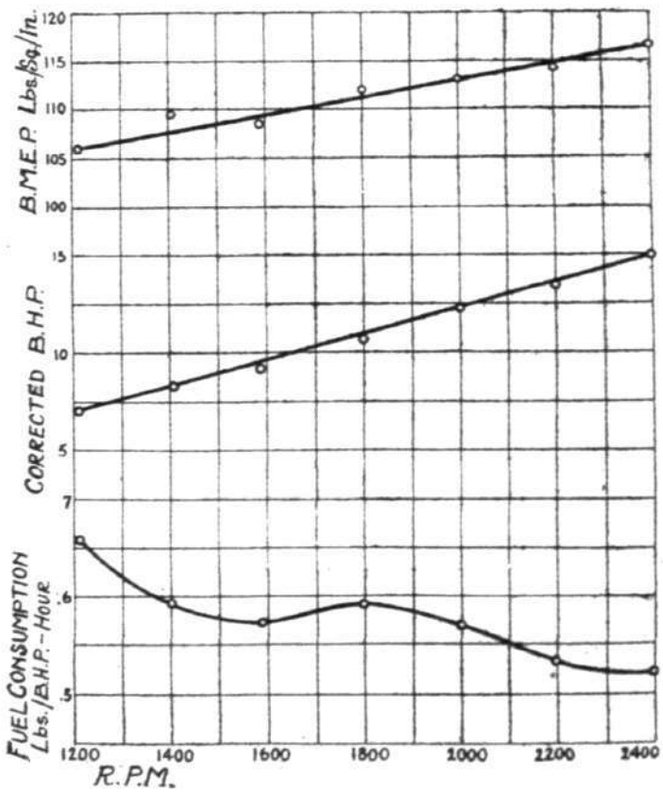
The crankcase is provided with a flange at the forward end for mounting a housing containing a reduction gear, if this is desired.

The cylinders, with integral cooling fins, are of cast-iron. They have interchangeable tulip-shaped valves seating directly in the spherical-shaped combustion chamber, with their axes inclined at 20 deg. to the axis of the cylinder. The clear diameter of the valve port is $\frac{13}{16}$-in., and the full lift of the valve is $\frac{5}{32}$ in. These valves are designed for good cooling, being provided with 45 deg. seats of $\frac{1}{8}$-in. width; the stems are $\frac{5}{16}$-in. diameter. The valve guides are made of cast-iron, and are easily removed. Each valve is held on its seat by a single coil spring, showing pressure of 28 lbs. with the valve closed.

Push rods and rocker arms operate the valves by means of a mushroom type cam, integral with the crankshaft, having a $\frac{13}{16}$-in. base circle and $\frac{3}{8}$-in. wide face. The inlet valve opens at top-centre piston position and closes 48 deg. late, whilst the exhaust valve opens 48 deg. early and closes at top-centre—the cams are thus identical. The push rods are extremely light, being made from duralumin tubing with steel ball fitting pressed into the ends. The rocker arms are supported by brackets, each held to the cylinder head by a single stud. Means for adjusting the tappet clearance is provided at one end of the rocker, and at the other end a small roller comes in contact with the tip of the valve stem.

Aluminium pistons, $2\frac{7}{16}$ ins. long, of the flat-ribbed head type are used, giving a compression ratio of 5 to 1.

The piston pin is of the full floating type, hardened and ground, .7 in. diameter. Aluminium or bronze buttons prevent the pin from scoring the cylinder. Each piston has three $\frac{1}{8}$-in. rings located above the pin.



Performance curves of the "S.P.E." 12-20 Light 'Plane Engine. Fuel used:—Domestic Aviation, spec.g. 0·72; Castor oil.

The crankshaft is of the two-throw counterbalanced type, with cranks at 180 deg., mounted on ball-bearings. By employing roller bearings for the crankpins the total offset between the axes of the cylinders is only $\frac{5}{8}$-in. Connecting rods are drop-forged steel with removable hardened liners

in the big ends which serve as the outer races for the crankpin rollers. A bronze piston pin bushing is used in the upper end of the connecting rod as a bearing for the piston pin.

Standing vertically at the back of the engine, the camshaft is supported in bronze bearings, and is driven from the crankshaft by a pair of bevel gears. At its lower end it is provided with jaws for hand starting with a crank. The oil-gear pump is driven from the camshaft by a set of spiral gears. The pump shaft extends through the pump casing, and at the rear end provision is made for driving a tachometer.

The engine is mounted upon flat surfaces machined on the underside of the crankcase, and is held to the supporting members by four ⅜-in. bolts. A small breather for the crank chamber is provided on top of the crankcase.

Ignition is by Bosch magneto, mounted vertically and driven from the upper end of the camshaft. A 1-in. special Stromberg carburettor is fitted, that shown in the accompanying illustrations being mounted for the engine arranged with its crankshaft in a vertical position. The mixture is led *via* a Y passage passing through the oil sump, which serves both to cool the oil and warm the mixture.

Simplicity is the keynote in the design of this engine, while the various parts are also very accessible—most of the units may be removed without disturbing any of the others.

AVIATION IN THE ARMY ESTIMATES

IN introducing the Army Estimates in the House of Commons on March 13, Mr. Walsh, Secretary of State for War, made the following references to the Royal Air Force in connection with Home Defence :—

"The new Committee of the Chiefs of Staff was set up by the last Government and is proving a great success. It saves a considerable amount of duplication of work. Military questions which require submission to the Committee of Imperial Defence can now be submitted, after they have been surveyed from the point both of the Admiralty and of the Air Force, with a view to securing a unified defence policy. The Committee has met a considerable number of times, and has discussed and made recommendations to the Committee of Imperial Defence on such subjects as co-operative training between the Army and the Air Force, the relation of the Army to problems of air defence, and various defence problems that affect the services jointly in various parts of the world.

"As I have mentioned the steps taken to secure co-operation between the three Services, I think the House would like to know what progress has been made in securing co-operation between the Army and the Air Force for home defence. This, as the House is aware, is one of the chief and most difficult problems with which we have to deal. In March, 1922, the late Cabinet decided that the Air Ministry was responsible for the defence of the United Kingdom against air raids. In December, 1922, the Committee of Imperial Defence approved the arrangements made between the War Office and Air Ministry, that the War Office should remain responsible for raising, maintaining, and controlling, both in peace and war, the ground troops which are required to assist the Air Force in the air defence of the United Kingdom, and for the design and provision of equipment for the anti-aircraft defences on the ground. These troops were to be commanded by a military officer responsible, as regards operations, to an Air officer, who is himself responsible to the Air Ministry. During the winter of 1922-23 a joint committee of the General Staff and Air Staff drew up a general scheme for the defence of certain portions of England. The allotment of ground forces in this scheme was reduced to the minimum limits compatible with reasonable security.

"The War Office is responsible for supplying ground defence formations proportionate to the air formations employed, and the ground troops required to meet the scheme are estimated at some 22,000, which represents an increase of about 19,000 to the formations now authorised. It is intended to raise these troops as part of the Territorial Army. The annual financial cost of this increase when the scheme is complete has been estimated at £600,000, but the initial cost is still not determined. I have indicated some of the military commitments abroad which the War Office has to envisage, and I have outlined the steps taken to secure co-operation with the Air Force for defence at home."

While speaking on the subject of the Territorial Army Mr. Walsh said :—

"Perhaps the most interesting development in the Territorial Force is its growing connection with the Air Force. It is necessary to increase establishment in order to provide for certain anti-aircraft brigades to assist in home defence. The strength of these brigades will ultimately come to 22,000 officers and men. They will be recruited and organised by the County Associations. Money has been taken for this purpose, but difficult questions of organisation remain still to be solved before a definite scheme can be promulgated. Schemes are now under consideration by the War Office."

Canadian Air Force

MAJ.-GEN. J. H. MACBRIEN, Chief of the General Staff (Canada), announces that the permanent Canadian Air Force is likely to be established on April 1, with headquarters at Toronto and other stations throughout the Dominion. Naval air squadrons will be based at Dartmouth, Winnipeg, and Vancouver. General MacBrien appeals for the cultivation of an Empire spirit, for a strong public opinion behind the Army and for greater defensive strength.

R.A.F. Corporal Killed

ON March 14, Corporal Shelley, of No. 1 Flying Training School, Netheravon, while flying to Aldershot crashed at Farnborough, the machine bursting into flames on striking the ground. Before assistance could be rendered the pilot was burnt to death.

A de Havilland Development

FOR some time experiments have been carried out at Stag Lane on a new form of spring-loaded trailing edge, which has the effect of automatically altering the camber of the wing according to the speed of the machine. Thus, with the engine running at full power, the hinged trailing edge rises, against the action of the spring, until it forms a continuation of the wing curve. In coming in to land, and with the engine throttled down, the spring pulls down the trailing edge and thus increases the camber. The extra range obtained in speed with the D.H.-50 used for the experiments was quite considerable, and the experiments are to be continued.

Institution of Aeronautical Engineers

THE date of the Annual Meeting of the I.Ae.E. has been changed to Monday next, March 24. After the meeting Mr. A. H. Ashbolt, Agent-General for Tasmania, will read a paper on "Empire Communications," and it is hoped that Commander Burney will be present and will take part in the discussion. Tickets may be obtained by writing to the Hon. Sec., 60, Chancery Lane, W.C.2. The meeting, which will be held at the Engineers' Club, will begin at 7 p.m.

A German Aerial "Ford"

THE Dietrich-Gobiet Fluzzengwerk A.G., of Cassel, are putting into production a two-seater monoplane, fitted with a 25-30 h.p. engine, designed by Richard Dietrich, which will, it is stated, be put on the market at a price lower than that of a small motor-car or motor-cycle. A feature of this machine, which will have a speed of 115 kms. (72 miles) per hour, is the rapidity with which it can be assembled and the simplicity and convenience with which it can be transported. Steel tubing and light metal are mainly used in the construction of this machine.

A New Association of German Aircraft Constructors

SOME little while back the Verband Deutscher Luftfahrezeugindustrieller was dissolved as a company and registered as an association. The following list of German aircraft firms, members of the association, may be of interest :—Albatros ; Caspar Werk ; Deutscher Aero-Lloyd ; Bahnbedorf ; Deutsche Werk ; Deutsche Lloyd Flugzeugwerk ; Daimler Motorenwerk ; Dinos-Automobil-Werk ; Dornier Metallbauten ; Gothaer Waggonfabrik ; Haw Propellerbau ; Ernst Heinkel Flugzeugwerke ; Haacke Motorenbau ; Dietrich-Gobiet Flugzeuwerke ; Mehlich ; Junkers Flugzeugwerk ; Luftfahrzeug ; Luftverkehrs-Ges. Arthur Muller ; Nordlug-Werke, Sablatnig Flugzeuglau ; Siemens and Halske ; Stahlwerk - Mark ; Steffen and Heymann ; Rohrbach Metallflugzeugbau ; Udet Flugzeugbau.

Colombian Air Services Successful

THE Sociedad Colombo-Alemana de Transportes Aeros ("Scadta"), the German company operating the passenger and mail air services in Colombia, has made considerable progress during its three years of operation. The company is, therefore, planning several new routes and additional transport facilities for the immediate future, and new, larger machines are being put into service.

AIR ESTIMATES IN THE HOUSE

THE Air Estimates 1924-25 were introduced by the Under-Secretary of State for Air, Mr. Leach, in the House of Commons on March 11. In introducing the Estimates, Mr. Leach stated that a review of the work of the Air Ministry for the past year and of the policy for the future was profoundly interesting, and that no one could remain unaffected by the magnificence of this organisation and the spirit of service which pervaded it from top to bottom. They had issued, along with the Estimates, a Memorandum by the Secretary of State, which showed an increase in the Estimates of £787,000 gross, and £2,500,000 net, due principally to the approved expansion of the Air Force. During the past year they had maintained eight squadrons of the Air Force in Iraq. They were the central element of the British garrison in that mandated territory. Their presence had enabled a reduction to be made in the number of ground troops in the garrison. In the past nine months that reduction had been from nine to four battalions, and they hoped still further to reduce it in the coming year. The officers of this force in Iraq were people of kindliness and good will, and were not engaged in shedding the blood of defenceless natives, nor were they recklessly using the air weapon for the purpose of terrorisation. The Iraq Air Force had other uses. On one occasion it conveyed medical relief by air to the scene of a serious railway accident. On another occasion it carried some 200 fever patients nearly 200 miles to the nearest hospital. That was from Kurdistan to Baghdad. The only alternative was by mules and donkeys over mountain paths, which meant inevitable death to large numbers of these patients. The House would, therefore, see that the civil administration of Iraq was immensely convenienced by these transport facilities. In the mandated territories of Palestine and Trans-Jordania, the air organisation continued to be a factor making for peace and good civil administration. The necessity for an offensive had only once arisen, and the revolt on that occasion was subdued inside 24 hours with armoured cars and one aeroplane. In Trans-Jordania they had only one flight of aeroplanes and one section of armoured cars. In Palestine now they had only one squadron of aeroplanes, one armoured car and one cavalry regiment. At Aden one flight of aeroplanes. Depredations by two tribes on the Hinterland trade routes were dealt with on one occasion about a year ago. Two machines sufficed to solve this difficulty, and both tribes surrendered on the following day. In Egypt and Somaliland things had been peaceful, and in India there were six squadrons. The deficiencies in the equipment there were being made good, and the efficiency of the squadrons had made a very marked advance during the current year. The Peace Treaty with Turkey had enabled four squadrons to be removed from Constantinople; three of these had been brought home and one sent to Egypt.

Speaking of co-operative work for the Army and Navy, he said the units for the Navy were organised now on a flight basis instead of a squadron basis. A flight usually consisted of six machines, and it had been arranged to form approximately five new flights. That brought the total flights associated with this work up to 21—in effect, 121 first-line machines. This number included only the initial first-line equipment. It took no account of reserve machines and engines held for the purpose of maintaining units up to strength. All this meant extra specialised training of a large number of officers and men. The results had been profoundly good. A number of landing trials had been made and experiments had been conducted with different types of aeroplanes. These had been proceeding throughout the year, and the Department believed that this country was well ahead of any other in all branches of naval aviation. The method of co-operative working between the Air Force and the Navy had been laid down by the National Imperial Defence Committee and accepted by both Departments. It was hoped that it would be in full working operation in the near future. With regard to co-operation with the Army, the release of the Constantinople squadrons had improved our position. This year one squadron had been formed for the Northern command. This would bring the Army co-operation squadrons at home up to four.

Turning to the question of the enlargement of the home Air Force, he said that many friends of this Government were anxiously asking how a Labour Government could justify itself in demanding an increase of air armaments. The Government were not increasing armaments, they were decreasing them. It was true they were adjusting them between the three Services, but the net result was a considerable decrease of war expenditure during the coming year. Again, the Labour Party had never urged the disarmament of Great Britain irrespective of what other countries might do. That was not a practical proposition, and he did not for a moment delude himself into thinking that the country would ever accept it.

A few days ago certain remarks of his on air policy in the House were severely criticised. It was represented that the presence of a pacifist at the Air Ministry was incongruous, if not indeed improper. He could not agree. He regarded it as most appropriate, that the policy of the fighting Services which were entrusted also with the development of peaceful aviation should have the colour of peace and good will given to them. Therefore, he had no regret for what he had said. International disarmament was their watchword. Everybody wanted it, but the point was that nobody could have it at present, and we must set ourselves to find why. It was not his purpose to render his country defenceless. He was making no proposals to act alone. The field of diplomacy must be explored to induce all nations to see that armaments did not protect. National security was a desirable thing, but we had not got it. No country had ever had it, and the more we tried for it the further we seemed to get away from it. Surely the most ardent advocate of great armaments must agree with him in that.

A week ago he was bitterly attacked by Major-General Seely. Was Major-General Seely not himself Under-Secretary for Air and Vice-President of the Air Council in the year 1919-20? Was that not also the year in which he scrapped the Home Defence Air Force?

Home Defence

The number of new squadrons to be formed for home defence this year was eight. By March, 1925, we should thus have 18 towards the 52 outlined within the next five years or thereabouts. The first Interim Geddes Report on National Expenditure, presented at the beginning of 1922, laid down the Cabinet view at that time that no great war need be anticipated for at least ten years. It further recommended that the Air Force Estimate be reduced from £15,500,000 to £10,000,000. They had departed from that recommendation. The Labour Party assumed office almost immediately following the adoption by the House of an enlargement scheme, and decided not to interfere with that scheme. The will of the House he took to be in favour of that scheme, but the condition of the Government was that if any international move for common reduction came along they should be free to accept it, and in that case, if circumstances warranted a deviation, they would hold themselves free to bring such circumstances before the House and act accordingly. The problem of forming these new squadrons was a formidable one. The late Government decided that they should be organised partly on a territorial or reserve basis. That meant legislation, and the Auxiliary Air Force and Air Force Reserve Bill would, therefore, shortly be introduced. Out of the 34 squadrons soon to be formed, 13 would be on this new basis. A great deal of civilian labour for repairs to aircraft and engines would be required, and new ground *personnel* would create further employment.

In the process of forming these new squadrons the initial training of pilots would proceed on the spot. By such measures they hoped the increase would be effected without a large addition to the existing service training establishments and store depots. We had four flying training schools, and it might be necessary to form another, but it was hoped not. Such overhead charges would, therefore, get cheaper as the enlargement proceeded. Negotiations for the purchase of six new aerodromes were also proceeding. Approximately 23 new stations, with the requisite sheds, workshops, and barrack accommodation, would ultimately be required. Difficulties surrounding the acquisition of sites had also to be overcome. Some of the sites disposed of after the War might be repurchased, and local interest might occasionally be against it. The Department hoped to be met in such cases in the right spirit by the people concerned. A joint Air Ministry and War Office Committee had been appointed to inquire into the organisation of the higher commands, communications, and questions of ground troops and general co-operation.

As to the general question of organisation, recruitment, and training, commissioned officers were divided into three classes—first, those with permanent commissions; secondly, short service commissions, who, after five years' first line service returned to civil life, with a four or five years' liability in the Reserve; thirdly, those officers seconded or lent by the Army or Navy for Air service for a period, and who returned to their parent services after its completion.

The first of these classes passed through the cadet college at Cranwell. The quality of these men was wonderful. Entering at 17½ to 19 years of age, they passed exceedingly stiff qualifying examinations. Equally stiff medical tests ensured their complete physical fitness. They were then trained in educational subjects, aeronautical science and engineering, general science, aviation, and practical science. The sieves through which they passed ensured that they had combed the nation's young manhood and found for their Service almost a special class apart. They were our most daring, most resourceful, most physically perfect, cleanest living, and ultimately highly skilled stock. The parents of such boys, were doubly blessed in the possession of their sons, and any Government taking advantage of them to pursue policies of aggression abroad would be guilty of odious treachery to them.

Short service officers came into being in 1919. The number and quality of candidates had shown continuous advance. The national advantages gained were worth pointing out. A boy leaving school at 18 or 19 became at once self-supporting, and he could also put by money. He was taught to fly, he received instruction in the mechanism and the running of aero engines, he served overseas, and became acquainted with other lands, he learned habits of discipline, and he re-entered civil life at 24 or 25 with a gratuity of £75 for each year of service.

The third class, seconded from the Army and Navy, was represented this year by 19 officers from the Army. The Naval attachments would, they hoped, be secured in the near future.

The non-commissioned officer pilot's case was also interesting. In 1921 it was decided to re-introduce the airman pilot into the Royal Air Force. He had been nearly abolished after the Armistice. The posting of trained airmen pilots to squadrons had now commenced, and everything pointed to its being a success. There were now 80 fully trained with squadrons at home and abroad, 40 more were being trained, and a further 40 would commence training during the summer. The young airman mechanic thus was given a chance to distinguish himself.

The total of flying hours during the year showed a marked increase. The total hours was 50 per cent. more than it was in 1922, which again were 40 per cent. higher than in 1921. Overseas showed a still higher average. There they had been flying with better climates than we possessed, as well as having more exacting duties in this matter. In India the actual increase in flying hours was nearly 100 per cent. Moreover, the ratio of accidents was steadily falling. For 1923 the hours flown for each fatal accident were 54 per cent. higher than in 1922.

Equipment

The progress of equipment for 1924-25, due to the expansion scheme, was to be accelerated. Orders to the aircraft industry this year would total £4,500,000. They would be placed so as to ensure as far as possible continuity of employment. Three new types of machines for naval co-operation were to be used, and other new types for Army co-operation were rapidly being developed. One new type of air-cooled engine had been tried this year, and another new type was to be introduced in the coming year. One new type of water-cooled engine, and also of greater horse-power, was also being tried out.

The trade would be interested to know that they were experimenting with metal construction on a very large scale. The Government was following a policy of ordering one metal aircraft to every experimental order given. The increased cost of aircraft building due to increase of size, complexity in their design, and the heavy increase of engine power necessitated research in the direction of new forms of structure. Metal lasted longer than wood, and therefore deterioration should be far less.

In research work the re-organisation promoted by his predecessor would come into operation this year. It would require larger expenditure, both direct and indirect, but it would spell economy in putting new machines more quickly into service. Realising the value of this Department and its activities, they were requesting an increased amount this year.

The amalgamation of four air transport companies into the Imperial Air Transport Company was due for completion at the end of this month. A subsidy of £1,000,000, spread over ten years, had been agreed, subject, of course, to conditions of mileage, flying, and other matters. This scheme was endorsed by the last Parliament, and it would be faithfully carried out on the part of this Government. Our principal civil aerodrome at Croydon would have to be enlarged, and it was proposed to spend, in the current year, £120,000 as a first instalment. Light aeroplane trials had been carried out at Lympne during the last year with very great success. This year, it was proposed to hold a competition for two-seaters, under more or less similar conditions. The Air Council was anxious to form, throughout the country, light aeroplane clubs, but this scheme could not be initiated until a dual control light aeroplane had been produced. Investigations on this matter were already afoot. The scheme would involve Government help in money and technical advice. For the present, they were not asking for money at all, but possibly a year hence, with some luck, the scheme might be ripe for presentation. The arrangements made last year for training the Royal Air Force Reserve pilots were also working well. Four schools were in existence, two more were being formed, and it was hoped that both would be functioning in the course of the next three months.

Airships

Very serious consideration had been given to the Burney airship scheme. Airship development had not had a very happy experience in this or any other country. The Government thought that the Burney scheme needed still more examination, and Commander Burney would have full opportunity of laying his views before the Cabinet Committee, which was considering the whole question. Therefore, he did not feel justified in asking for any money this year for airships.

Captain W. Benn : Is it proposed, if the scheme is approved, that the airships shall work under the Air Ministry or the Admiralty ?

Mr. Leach : I cannot give a definite reply as to what is being proposed. All I can say is that should it become necessary later in the year to ask for money for the construction of lighter-than-air-ship development, we shall present a Supplementary Estimate.

Commander Bellairs : Has the hon. gentleman any idea when the Cabinet Committee will come to a decision ?

Mr. Leach said he did not think the decision would be delayed very long. The Ministry were very anxious to develop civil flying. Dealing with the meteorological service of the Ministry, the hon. member said it was a wonderful life-saving agency, and that, at a net cost of £105,000, it was a remarkably cheap and productive investment.

He was in rather a strange position. He found himself, a pacifist, pleading with the chosen representatives of his country to strengthen the Air Force. He could not lose sight of the fact that only by agreement among the nations would the purpose that he sought be achieved. His country, in a world of fear and distress, sought protection in preparations for force, like all other countries. He could not ask it to disarm ; that must come mutually ; but hopes of it continued to burn brightly. There was a world-demand for it which must be met. The air weapon, which it was his duty to ask the House to burnish and to sharpen, had now become for its purpose the most dreadfully effective weapon of war. Therefore, though they were organising the force and increasing its numbers, the Government owed to the force this sacred duty, which was inseparably connected with the Government's foreign policy. If the Government's foreign policy were aggressive or pugnacious, they would play a game of treachery to these young men. If, owing to their willingness to die for their country, the Government took the course of arrogance abroad, their blame would be too great for measurement. The more the Government asked these young men to serve them, the more pacific must be the Government's course. He was proud to belong to a Government which sought religiously the good will of all the world.

Sir S. Hoare said that Unionist members would have noted with no little satisfaction how fully and unreservedly Mr. Leach identified himself with the traditions of that great Service which he was called on to represent. He noted with particular interest those remarks of Mr. Leach which referred to the operations of the Air Force in Iraq. It was satisfactory to know that the present Government was maintaining in every respect the policy that he maintained during the year that he was in office. With one exception the present Estimates were those prepared by him (Sir S. Hoare). He was glad that the expansion programme which he initiated was being, at any rate so far as its first stage was concerned, carried on by his successor. One of the pledges which he (Sir S. Hoare) gave a year ago was to increase the Home Defence Force. It was worth noting that the Air Force was being doubled, and that the Home Defence part of it was being increased tenfold for a sum which was only going to add 30 per cent., even when the full expenditure came into force in two or three years' time, to the total of the Air Estimates, and only 30 per cent. to the Air Force *personnel*. That

showed that the programme initiated by the last Government was not only effective but economical.

Another pledge which he gave the House was in regard to the development of civil aviation simultaneously with the expansion of military aviation. He was successful after long and complicated negotiations in bringing together the four small civil air transport companies and in helping them to amalgamate in a big and broad enterprise. It was interesting to him to note that the Under-Secretary for Air had no criticism to make of those arrangements.

A third undertaking he gave was that so far as he could he would develop once more the policy of airship operations by means of commercial enterprise. A Committee was appointed consisting of himself, the First Lord of the Admiralty, and the Financial Secretary to the Treasury, which considered various schemes and eventually accepted the principle of the scheme associated with the name of Commander Burney, member for Uxbridge. The main conditions of the scheme and the financial arrangements in regard to it were described by him to the Economic Conference in the autumn, and a report of his speech was then published in the Press. If that scheme proved successful it would be possible to reach Cairo, not in from five to eight days, but in two days; Bombay not in 14½ days, but in 4½ days; Singapore not in 28 days, but in eight days; and Perth—supposing the service continued to Australia—not in 28 days, but in 11 days. He regretted most sincerely the omission from the Estimates of any provision for airships.

Before he left office he had included in the Estimates a sum of £400,000 for bringing into operation at once the first stages of this great enterprise. Today the Under-Secretary told them they were to have another enquiry into a question upon which there had been enquiry after enquiry. It was the more regrettable because he was certain that when this further investigation was finished it would be found that there was no quicker or cheaper way of getting six gigantic airships into the air between here and India than upon the lines of the agreement virtually arrived at before he left office. If the Government decided to operate these airships themselves they would find the experiment not only very dangerous, but very expensive.

Adequate Air Defence

Turning to what he described as the central question of air defence, he said that hon. members on that side could not disguise from the Under-Secretary that they had a good deal of anxiety and uncertainty still as to the amount of enthusiasm that was going to be put behind the carrying out of the expansion programme. Mr. Leach and Lord Thomson hedged round their acceptance of the programme with so many excuses that many members wondered whether the scheme was going to be pushed through in the way they desired. It seemed to him the Secretary for Air and the Under-Secretary were unnecessarily making excuses for carrying out the elementary duty of a Government—the duty of national defence. He could not help thinking that today the Under-Secretary protested too much as to his pacifist opinions. They on that side were just as anxious as Mr. Leach to see a reduction of armaments, but that reduction was not going to be brought any nearer by statement after statement that seemed to imply that the Government had no faith in the adequacy of national defence.

The most serious part of Mr. Leach's former speech was not his pacifist *obiter dicta*, but his confession that air defence could not be adequate. It was entirely misleading to say that adequate air defence was not attainable. If his (Sir S. Hoare's) programme was carried out in detail, and if simultaneously the anti-aircraft defences of the War Office were fully developed, adequate air defence was certainly attainable. If the Government pushed on the schemes already in existence for combined defence, enemy raids, even if sporadically they penetrated, would become fewer and fewer, their formations would be broken up, and they would be driven to a height from which the aim of their bombs could not be accurate. [Lieut.-Commander Kenworthy: Are we to understand the right hon. gentleman left office without any scheme of co-ordination between the military and air defences?] The hon. and gallant member must understand nothing of the kind. There was a fully-worked-out scheme, and he hoped the Under-Secretary would see it was carried into effect.

Referring to the resolution which stood on the paper in the name of Mr. Penny that the Air Force here should be adequate to defend these shores from the strongest air force within striking distance, he said he would have thought it a resolution that any Government would have welcomed. It was something more than an abstract pedantic resolution; it was a very useful, workable formula. The Government had said that they were prepared to accept the first part of the scheme of expansion, but not to go farther. They could not isolate one stage from another. If the Under-Secretary and his Government were going to restrict themselves to the first stage and did not look ahead, they would find that it would be much more difficult to carry out the subsequent stages. It was most important that the Government should accept Mr. Penny's resolution, and should show by their acceptance that they were prepared to carry out the extension programme of the late Government, and that it would carry out the first stage in such a way as to make the carrying out of the later stages economical and expeditious.

Major-General Seely said that Sir Samuel Hoare was hard to please if he was not satisfied with the attitude of the Under-Secretary for Air. The Under-Secretary had admitted that this was a policy of expansion, both of men and materials. The Under-Secretary had assumed the *rôle* of the strong, stern Minister and had rebuked him (Major-General Seely) as the pacifist. But the hon. gentleman had forgotten that he resigned his post as Air Minister because he believed that Mr. Churchill was sacrificing the Air Force to the Army, and because the air expansion was not rapid enough. The Estimates did represent a considerable increase. It was true that a great part of it was due to Sir. S. Hoare, but some parts of it were due to the present Secretary of State and the Under-Secretary.

It was quite wrong to suggest that the increases were due to the increased air force of France. When it was proposed recently to have a neutral pact France openly stated that if we increased our land forces and our naval forces they were prepared to reduce theirs, and he had heard, and had seen it stated, that, as all that France wanted was security, if we would make ourselves stronger in other directions—in the air—the French would feel themselves justified in reducing their air forces. A delegation from the Department was shortly to inspect the air forces of France, and he prophesied that these officers would report that it was apparent for various technical reasons that the increase of French air power could not be directed against this country. He asked the House seriously to say that in the expansion of our air forces we had no idea of replying to a menace from France. He urged the importance of co-ordination in defence, and asked how far the arrangement by which there was an increase in the Air Force and a reduction in other Forces had been scientifically considered. He also laid stress on the importance of interesting the Dominions in air defence, and said he believed that if the Prime Minister were to invite the Dominions and India to join in forming an Imperial Board of Aerial Research, there would be a surprising response. We wanted the newest and most original brains, and men from our Dominions had shown themselves foremost in the matter of research and novel ideas.

Unionist Amendment

Mr. Penny moved: "That in the national interests it is essential that the Air Force should be administered in such a way as to ensure adequate protection against air attacks by the strongest air force within striking distance of our shores, and to foster and assist civil aviation, and to secure economy and increased efficiency in regard to construction, equipment, *personnel*, research, and routine." He contrasted the speech which the Under-Secretary had just delivered with the hon. member's previous utterance.

Lieut.-Colonel Windsor-Clive, in seconding the amendment, asked whether the Government accepted the standard of air strength recommended by the Committee of Imperial Defence. He agreed that every hon. member wished to secure the limitation of armaments, but they would only get that limitation when they had an adequate Air Force. This country must have something to bargain with.

Lieut.-Colonel Williams urged that the Air Forces should be withdrawn from Mesopotamia and Palestine, where they were being used to maintain mistaken policies, and added to the home Force, which was undoubtedly below strength.

Captain W. Benn said that no one complained that the Air programme of the Government, being, in fact, the programme of their predecessors in office, was insufficient for the needs of the country at the moment. What the House was, in fact, asked to do by the amendment was to enter into competition with other nations in air armaments. It would be very unwise for the House to vote for such a declaration. Moreover, no material advantage would be gained by the adoption of the policy recommended. Every increase in our Air Force had been followed by an increase in the French Air Force. It was said in France that in aviation they were foremost of the world, and that they would do their utmost to stay there.

Sir F. Sykes said the amount of money available for defence should be divided between the three arms so as to obtain the best combined result from them. The most glaring weakness

of our system of defence was the absence of any co-ordinating power short of the Cabinet itself. Combined policy and action by the three Services was of vital importance to the safety of the Empire. The real solution lay in a correlation of defence controlled by a Defence Ministry, with the Prime Minister as chairman, and with a joint staff which would really think out the problems at issue. He hoped the Government really knew what they were doing in this great problem. Were they now beginning to work on a line of thought-out Imperial policy, or were they merely carrying on because the public obviously would not stand the subject being entirely ignored? During 1920, 1921, 1922, and 1923 we spent £700,000,000 on defence, yet for this vast expenditure we had no security. We were now relatively weaker than in 1914, and our greatest weakness lay in the air. The great lack was a superior guiding policy for the fighting departments, and a controlling force to ensure their adherence to a common policy. He thought that the method of dealing with the airship problem was very disquieting. He urged the Under-Secretary to weigh carefully before it was too late the loss which would arise if airship development were placed under military control.

Sir P. Sassoon said that the nation would not grudge the cost of an Air Force of sufficient strength to make it unsafe for another country to attack us, and the whole Empire would view with dismay and disapproval any Government which failed to safeguard the pressing needs of the Empire in this important matter.

Mr. A. Chamberlain expressed regret that the Government had hung up yet again for another enquiry the airship scheme. He hoped they would conduct that enquiry as quickly as possible, and, as had happened pretty often, would come to the same conclusion as their predecessors had done. He wished to concentrate attention upon the important question of what policy ought to inspire the Government in regard to the Air Force. Had the Government a policy in this important matter? The late Government had a policy which was embodied—not textually—in the amendment which had been moved. Would the Under-Secretary say specifically whether this was the policy of the present Government, and, if not, what they had abandoned and what they had put in its place? That was a question that was not affected by what might happen under an international agreement if such were reached for the limitation of armaments. Any standard we set up might be revised and reduced as the result of any such agreement. He was speaking only of what was to be our Air Force policy until there was such a general agreement or an agreement among the Great Powers as was made with regard to capital ship construction. He deprecated the Government waiting on the possibility of that before formulating their policy. Let them have their policy for the position as it was, and as it might continue for an indefinite time.

Unless they had a settled policy, such as the late Government had, and carried it out steadily until the circumstances were changed by international agreement, they ran the risk of panic in this country—panic that would force the Government or their successors to build in great haste.

Mr. Leach, remarking on the unanimity that had characterised the debate, asked why in these circumstances there was an amendment to his motion. Mr. Chamberlain found fault with the Government for having hung up still further the lighter-than-air-ship legacy entrusted to them by the late Government. He wanted one or two reasons why that had been necessary. He observed in *The Times* that day a letter from the hon. and gallant author of this scheme (Commander Burney) in which he made the declaration that "in this undertaking private capital shoulders the major risks."

Commander Burney said that statement was not correct. The arrangement was that private capital found £200,000 of ordinary shares and the Government £400,000 of debenture shares. He had always understood that ordinary shares took the risk. If there was a failure the Government foreclosed on the whole of the property, private capital lost the whole of the money, and the Government obtained the £600,000 spent on airship development for £400,000.

Mr. Leach said that the total amount of the taxpayers' money which it was intended to put into this scheme was £4,800,000. It was true that there was a provision to pay some half of that back, if the profits allowed, to the State. But Commander Burney had stated that private capital took the major risk. The whole of this sum was going to be risked, and while the Government's share from the taxpayer was £4,800,000, the whole of the sum risked by private capital was only £500,000. That fact, he thought, disposed of the idea that this scheme ought to be presented to the House at this juncture without further investigation.

Commander Burney asked the hon. member to give the facts correctly. No other money of the Government was risked until the first stage had been completed, and until the whole programme had been shown to be feasible. Then the second stage came into operation, and no further money other than that for the second stage became due from the Government until the service was on a paying basis. Further than that the Government was repaid £3,300,000 out of that amount, with a further amount added to make it £4,800,000.

At 8.15 Mr. Clynes moved the closure, which was agreed to. The House then divided, and the amendment was rejected by 269 votes to 195—majority, 74.

THE ROYAL AIR FORCE

London Gazette, March 11, 1924.

General Duties Branch

The following are granted permanent commns. in ranks stated (March 12):—*Flt. Lts.*—E. P. Mackay, N. V. Wrigley. *Flying Officer.*—L. Martin.

A. C. Tremellen is granted a short service commn. as a Flying Offr., with effect from, and with seny. of, Feb. 26.

The following Pilot Offrs. are promoted to the rank of Flying Offr.:—L. G. Pinnell; Dec. 10, 1923. A. King-Lewis; Feb. 16. Flying Offr. H. W. Hewson resigns his short service commn. and is permitted to retain his rank March 15. Flying Offr. J. W. Sole resigns his short service commn; March 12. Wing Commdr. P. S. Rickcord (Comdr. R.N., retd.) is re-attached for a further year's duty with R.A.F.; March 1.

Stores Branch

Sqdn. Leader J. E. Parkin, M.B.E., is placed on the retired list, and is granted rank of Wing Comdr.; March 12.

Reserve of Air Force Officers

The follg. are granted commns. on probation in General Duties Branch in ranks stated; March 11:—

Class A.—Flying Offrs.—H. S. Basford, J. C. Cantrill, H. A. V. Kirk, H. Laycock, H. Marsden, W. Munn, J. A. Shaw, G. W. Thorpe. *Pilot Offrs.*—V. H. E. Baker, W. H. Basker, R. A. Coulthurst, W. Dougall, J. C. Edwards, L. E. Falla, V. Foster, H. L. Miller, F. H. Pidgeon, G. H. E. Roxburgh, G. W. Smart.

Class B.—Flying Offr.—E. McL. Cleland. *Pilot Offr.*—A. Y. Paton, D.C.M.

The follg. officers are confirmed in rank, with effect from the dates indicated:—*Flying Offrs.*—H. Hickson; Feb. 21. B. Martin; Feb. 23. K. W. Brewster, M.C., W. J. Hutchinson; Feb. 28. G. T. Legge, F. G. M. Sparks; March 11. *Pilot Offr.*—T. L. I. Bell; Feb. 10. *Pilot Offr.* I. J. Sankey is transferred from Class A to Class C; Feb. 23.

London Gazette, March 14, 1924

General Duties Branch

The following Pilot Offrs. on probation are confirmed in rank:—A. H. Grace; Dec. 10, 1923. Y. W. Burnett, J. S. Dick, S. R. Sunnucks; Jan. 9. G. J. Gaynor; Jan. 12. R. Barrett, P. R. Stroud; Jan. 16.

Memoranda

The permission granted to the following to retain their ranks is withdrawn on their enlistment in the Army:—Lieut. C. R. V. Cook, Sec.-Lieut. P. C. Saxby.

QUESTIONS IN PARLIAMENT

Herring Fishery and Aircraft Assistance

SIR ROBERT HAMILTON, on March 11, asked the Secretary for Scotland whether he is prepared to renew negotiations with the Air Ministry with a view to carrying out experimental flights over the waters to the North of Scotland for the purpose of locating shoals of fish during the summer herring fishing season?

Mr. Adamson: The Fishery Board are already in communication with the Air Ministry with a view to ascertaining whether any arrangements for such experiments in Scottish waters will be practicable.

Air Operations, Iraq

LIEUT.-COL. MOORE-BRABAZON, on March 13, asked the Under-Secretary of State for Air whether the policy of the late Secretary of State for Air is being continued in Iraq under which bombing raids are strictly prohibited for the purpose of the collection of taxation; and whether, in the interests of the Royal Air Force in Iraq, he will state whether bombing raids for the purposes of taxation have ever been carried out in the past?

Mr. Thomas: The reply to the first part of the question is in the affirmative. With regard to the second part, I have already informed the House on two occasions that bombing raids have never been carried out for purposes of taxation.

AIR POST STAMPS

By DOUGLAS B. ARMSTRONG

Special Stamp for Polar Flight

THE first Norwegian air post stamp will be issued, it is understood, in connection with Amundsen's impending trans-Polar flight expedition. The Norwegian Government has decided to accede to the public demand by creating a special 25-ore postage-stamp, which will be employed exclusively in franking to their destination the souvenir postcards already described in this column; hence the value 25 ore, representing the international postage rate to any part of the world. Only a sufficient number of stamps to prepay trans-Polar mail will be issued, and this particular stamp will not be available for any other postal purpose.

Italian Air Stamp Essays

To Italy belongs the credit of having issued the first pair of official air post stamps, albeit of a provisional character, in May and June, 1917. It is remarkable, therefore, that she should be numbered amongst those countries who are as yet unprovided with a definitive air post stamp. Some exceedingly handsome "essays" for Italian air post stamps have, however, recently been received in open competition by the journal *Revista Filatelica d'Italia*, and these, to the number of 78, have been submitted to the Chief of the Administration at the Commissariate of Aeronautics with a view to their ultimate adoption for the Posta Aerea d'Italia. Most of the designs partake of a patriotic or allegorical nature, and many are of high artistic merit. The highest awards fell to the following subjects: Aeroplane over the Forum (Prof. Morelli, Turin); figure of Icarus (Sig. Vsevolode, Nervi); head of Italia wearing winged crown of glory (Prof. Craffonara, Genoa); head of Leonardo de Vinci (Prof. Craffonara); winged female figure supporting aeroplane propeller (Sig. Carpanetto, Turin).

Siamese Air Mail

AT the end of last year a new air mail line was opened up by the Siamese postal service between Nong-Khay and Bangkok *via* Roi Ed and Korat. A special postmark is employed, struck in black, containing the outline of an aeroplane within concentric circles with the names of the termini in both English and native characters. It is a smaller cancellation than that previously used in the Roi Ed, Korat-Ubol Service.

Aero Stamps that Failed

QUITE an interesting collection might be made of essays for air stamps, both official and otherwise, that for one reason or another have never passed beyond the embryo stage. It would include, of course, the very effective series of designs submitted in the competition for a British Air Stamp promoted in connection with the London International Stamp Exhibition last year, as well as an official set of essays submitted to H.M. Postmaster-General by a prominent firm of stamp engravers. As far back as 1919 the French Government Printing Establishment prepared designs for a series of three air post vignettes, dies for which were engraved by the distinguished artist M. Ruffe, and one of them was subsequently adopted for the "Par Avion" label affixed to air-borne correspondence passing through the French post office.

A very striking essay for a definitive Spanish air post stamp was executed by Don Bartholome Maura, chief engraver to the Madrid Mint early in 1921, depicting an aeroplane flying low over a sunlit bay, with a small steamship visible on the horizon. Fluted columns on either side of the vignette supported the Spanish national arms, whilst the inscription "Correo Aereo" extended across the foot of the stamp. It was proposed to issue stamps of this design in denominations 10, 25 and 50 centimos, but so far they have failed to materialise. Newfoundland has also produced some handsome air stamp essays in connection with the proposed establishment of a regular air mail between St. John's and Halifax, Nova Scotia. One of the designs shows an aeroplane flying over a pine forest, another the harbour of St. John's with an aeroplane overhead, and a third a 'plane passing over a cloud bank. All three are inscribed "Newfoundland Aerial Postage," and have a Caribou Head inset. A recent essay for a German air post stamp shows two eagles perched on a mountain crest, and watching an aeroplane that is passing overhead. It is a far superior design to the "flying clothes-peg" that at present disfigures the air stamps of Germany.

Belgium, Portugal, Roumania, Czecho-Slovakia, Denmark, and Finland are amongst the other countries where air stamp essays have been created, at one time or another.

SOCIETY OF MODEL AERONAUTICAL ENGINEERS

THURSDAY, March 27, at 7.30 p.m., Mr. A. F. Houlberg will give a Lecture on "Early Model Aeronautical Experiences" (illustrated by lantern slides), at Headquarters of the S.M.A.E. British Empire Room, Central Y.M.C.A., Tottenham Court Road, London, W.C. 1.

March 30, on Parliament Hill, at 11 a.m., the Freshman's Competition will be held. For full particulars see FLIGHT, February 21, p. 110. Intended competitors who have not already done so should send full particulars of their machine to the Hon. Competition Secretary, Mr. C. Bayard Turner, 27, Ouseley Road, Balham, S.W. 12.

Anyone who is interested in flying models in South London can meet members of the S.M.A.E. on Mitcham Common any Sunday morning, weather permitting.

A. E. JONES, *Hon. Sec.*

SIDE-WINDS

MESSRS. AUTO RADIATORS, LTD., who specialise in radiator and sheet metal work, notify us that they have now removed to Whitfield Place, Whitfield Street, Tottenham Court Road, W.1, the new premises being conveniently situated just at the rear of the Grafton Hotel.

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THE British Thomson-Houston Co., Ltd., inform us that they will have a very comprehensive and interesting exhibit in the Electrical section of the Palace of Engineering at the forthcoming British Empire Exhibition, Wembley. The stand in question will occupy a floor space of 87 ft. by 75 ft., and the exhibits will include a complete automatic sub-station in addition to the large range of electrical machines and equipment, both large and small, handled by this firm.

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WE have received an instructive booklet on the welding of cast-iron from the Suffolk Iron Foundry (1920), Ltd., of Stowmarket, who have specialised in the manufacture of cast-iron welding rods and fluxes. This booklet tells us about the welding of cast-iron and the various "S.I.F." products.

IMPORTS AND EXPORTS, 1923-1924.

AEROPLANES, airships, balloons and parts thereof (not shown separately before 1910). For 1910 and 1911 figures see "FLIGHT" for January 25, 1912; for 1912 and 1913, see "FLIGHT" for January 17, 1914; for 1914, see "FLIGHT" for January 15, 1915; for 1915, see "FLIGHT" for January 13, 1916; for 1916, see "FLIGHT" for January 11, 1917; for 1917, see "FLIGHT" for January 24, 1918; for 1918, see "FLIGHT" for January 16, 1919; for 1919, see "FLIGHT" for January 22, 1920; for 1920, see "FLIGHT" for January 13, 1921; for 1921, see "FLIGHT" for January 19, 1922; for 1922 see "FLIGHT" for January 18, 1923; and for 1923, see "FLIGHT" for January 17, 1924.

	Imports.		Exports.		Re-Exports.	
	1923.	1924.	1923.	1924.	1923.	1924.
	£	£	£	£	£	£
Jan. . .	466	2,213	60,079	52,239	280	2,219
Feb. . .	641	920	120,236	26,349	3,040	335
	1,107	3,133	180,315	78,588	3,320	2,554

AERONAUTICAL PATENT SPECIFICATIONS

Abbreviations: cyl. = cylinder; I.C. = internal combustion; m. = motor
The numbers in brackets are those under which the Specifications will be printed and abridged, etc.

APPLIED FOR IN 1922

Published March 20, 1924

31,816. VICKERS, LTD., and O. D. LUCAS. Ignition systems for flares, bombs, etc., for dropping from aircraft. (211,567.)

33,058. D. J. MOONEY. Structural members for aircraft. (211,606.)

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